

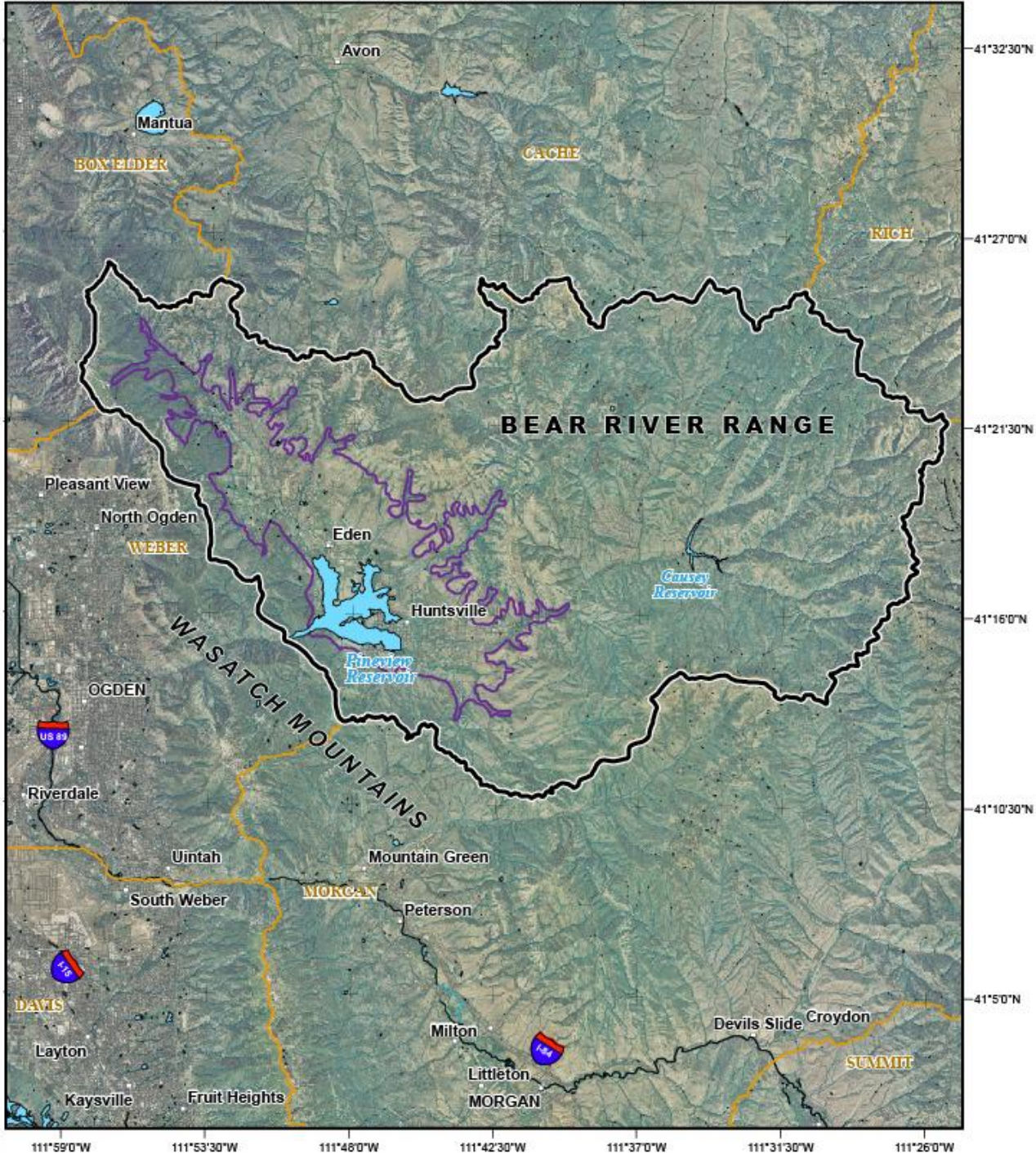
# Proposal

## HYDROGEOLOGIC STUDY OF OGDEN VALLEY, WEBER COUNTY, UTAH, WITH EMPHASIS ON DEVELOPMENT OF A WATER BUDGET







- Prepared by Mike Lowe, Janae Wallace, and Stefan Kirby, Utah Geological Survey

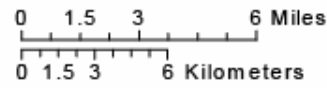
**The primary goals of the study are:**

- (1) To characterize the hydrogeology of the Ogden Valley drainage basin as it pertains to the occurrence and flow of groundwater, with emphasis on (a) pathways of recharge to discharge, (b) groundwater-surface water interactions, (c) delineating the thickness of the valley-fill aquifer, and (4) determining the water-yielding characteristics of fractured-rock aquifers in the study area.**
- (2) Develop a water budget for the drainage basin that includes components of recharge and discharge.**



### Explanation

-  Ogden Valley drainage basin study area
-  Ogden Valley fill boundary
-  Road
-  Town/city
-  Stream
-  Water body



**Location Map**

# Proposed Tasks

- **Compile geologic map of Ogden Valley drainage basin; refine, as necessary, with new mapping; construct three cross sections; construct two stratigraphic columns**
- **Assemble existing well data and specific capacity and aquifer tests**
- **Measure water levels in selected wells and construct potentiometric surface map for principal valley-fill aquifer and, where possible, shallow unconfined and selected fractured-rock aquifers**
- **Collect groundwater samples and analyze for environmental tracers and geochemistry, including total-dissolved solids and nitrate from 20 wells and springs**
- **Delineate hydrostratigraphy of valley fill and fractured-rock units, and produce up to six valley-fill cross sections; isopach and structure-contour maps for valley-fill aquifer and, where sufficient information is available, select fractured-rock aquifers**
- **Produce conceptual model of groundwater flow in Ogden Valley drainage basin**
- **Develop water budget showing components of recharge, discharge and change in storage including estimates of error for each component**
- **Write final report summarizing results of study**

# Proposed Products

- **Hydrostratigraphic map at 1:100,000 scale in GIS format**
- **Cross sections, Structure contour maps for valley-fill aquifer and aquitard layers and selected fractured-rock aquifers, Isopach map showing thickness of valley-fill deposits in GIS format**
- **Potentiometric surface map(s) in GIS format**
- **Water budget maps that show areal recharge including precip, stream seepage and other sources; and discharge including ET, well withdrawal and gaining streams**
- **Water budget showing components of recharge, discharge and change in storage including estimates of error for each component**
- **Report, including evaluations of environmental tracer data to delineate recharge and discharge, conceptual model of groundwater flow, and water budget for Ogden Valley drainage basin**

# Who benefits from this proposed comprehensive study utilizing state-of-the-art study techniques?

- Weber County planners and Ogden Valley citizens will know if groundwater supply is an issue that helps determine total number of lots in Ogden Valley.
- Ogden Valley water suppliers will know if new or proposed upland bedrock wells have the potential to impact existing water rights and public supply sources.
- Utah Division of Water Rights will understand the potential for proposed upland bedrock wells within or without the Ogden Valley drainage basin to draw ground water across county lines.
- Ogden City officials and residents will better understand flow paths to their Pineview Reservoir area well field and the potential for impact of development on their water supply.
- Weber Basin Water Conservancy District and the Utah Division of Water Rights will better understand the quantity and distribution of groundwater in the Ogden Valley drainage basin.
- Wasatch Front Weber County citizens, Weber County officials, and Utah Division of Water Rights regulators will know if groundwater development in Ogden Valley has the potential to impact east shore area of Great Salt Lake water rights.
- After the proposed study is completed, enough information will be available to build a state-of-the-art groundwater flow model if there is desire to do so and funding available.

# Timeframe and Budget

- The proposed study would begin July 1, 2015 and would be completed by June 30, 2017 (two years).
- The cost of the project will be \$120,000 each year, of which the Utah Geological Survey will provide about \$60,000 in in-kind match each year. \$60,000 of outside funding will be required each year (Utah Division of Water Rights - \$10,000, Weber Basin Water Conservancy District - \$20,000, Weber County- \$15,000, Ogden City - \$15,000).

## UGS Project Personnel

- Mike Lowe – Manager, Groundwater & Paleontology Program – project coordinator
- Stefan Kirby – Senior Geologist – oversight water budget
- Janae Wallace – Senior Geologist – geochemistry, co-author
- Lucy Jordan – Senior Geologist – potentiometric surface mapping, conceptual model of groundwater flow, co-author
- Jon King – Senior Geologist – geologic map and cross sections, co-author
- Brittany Dame – Geologist – data assembly, potentiometric surface mapping, geochemistry, valley-fill cross sections, isopach maps, structure contour maps, water budget, first author
- Nathan Payne – GIS analyst – GIS work for most study products
- Zach Anderson – GIS analyst – GIS work on geologic map